

CAM. In addition, the battalion commander may ask his subordinates to nominate areas for minefields.

Once a unit employs FASCAM, the mines have a pre-set self-destruct time so that units can use the area after the mines have exploded. But the commander should not count on every mine to self-destruct, and he should use caution if he must move through a former FASCAM area.

Another concern of the company commander should be what will happen to his fire support if the supporting artillery unit shoots FASCAM. It will take a 155mm field artillery battery 20 minutes to fire a planned minefield of 400 x 400 meters and an additional amount of time to displace to reduce the counterfire threat. During this time, no other artillery fires will be going out.

If the direct support field artillery battalion is not reinforced, this will take away one-third of the brigade's artillery support while the unit emplaces the mines.

Lastly, if a company commander is asked to nominate a target area to the battalion, he should realize that the mines are not good on all terrain. They will be less effective if employed on hard areas such as those in cities or on soft areas such as marshes or snow-covered terrain. (It is well to note that remote antiarmor mine system (RAAMS) mines will not deploy their tripwires if they tilt more than 50 degrees. Thus, they should not be used on steep or broken terrain.)

Although these are not new lessons, in a peacetime Army many infantry units may not get to train with the

artillery units and other fire support elements they may work with in combat.

Fire support will play as important a role in the future as it has in past wars. As the OAC infantry-artillery program develops more fully, it will play a part in teaching company grade infantry officers about fire support and future FSOs about maneuver. The end result will be better synchronization between artillery and maneuver forces, with correspondingly better results on the battlefield.

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Artillery Effects Test

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As part of a study of artillery effects, the following scenario was fired three times in a test at Fort Sill in June 1990:

A mechanized infantry team commander is given a mission to defend and hold key terrain. After a review of the area, he develops a plan and assigns areas of responsibility to each of his subordinate platoon leaders. With engineer support, fighting positions with overhead cover are prepared for the infantry. Turret and "hull-down" positions are prepared for the Abrams tanks and Bradley fighting vehicles. Obstacles consisting of a tank ditch, minefields, and wire are emplaced in front of the infantry positions.

Enemy intelligence units monitor this

activity and information is collected. The enemy commander is ordered to attack. As part of his plan, an artillery preparation is ordered with a criterion of 30 percent destruction. Three enemy artillery battalions fire 2,600 rounds of conventional munitions and 15 minutes later, 50 percent of the defenders are dead or wounded.

This test was designed to examine both U.S. and threat doctrine and to measure artillery effects on troops and equipment entrenched in a defensive position. The effects were more devastating than our Joint Munitions Effects Manuals (JMEMs) predict. They clearly demonstrated that an artillery unit firing Soviet norms can achieve the desired degree of destruction. At the

same time, though, they also demonstrated that properly constructed defensive fighting positions and properly protected soldiers will help units survive artillery fires.

Our "target" was a defensive position designed by representatives of the U.S. Army's Armor and Infantry Schools. The position design was based on a European scenario (see diagram). The doctrine used to establish dismounted defensive positions is essentially the same, however, for either a European or a Southwest Asia (SWA) scenario. The threat forces that U.S. Army ground forces faced in SWA used essentially the same doctrine as that of the Soviets. Thus, the results obtained from the test are valid for either situation.

Although the test was fired on a varied array of targets, this article will discuss only the effects on the infantry fighting positions.

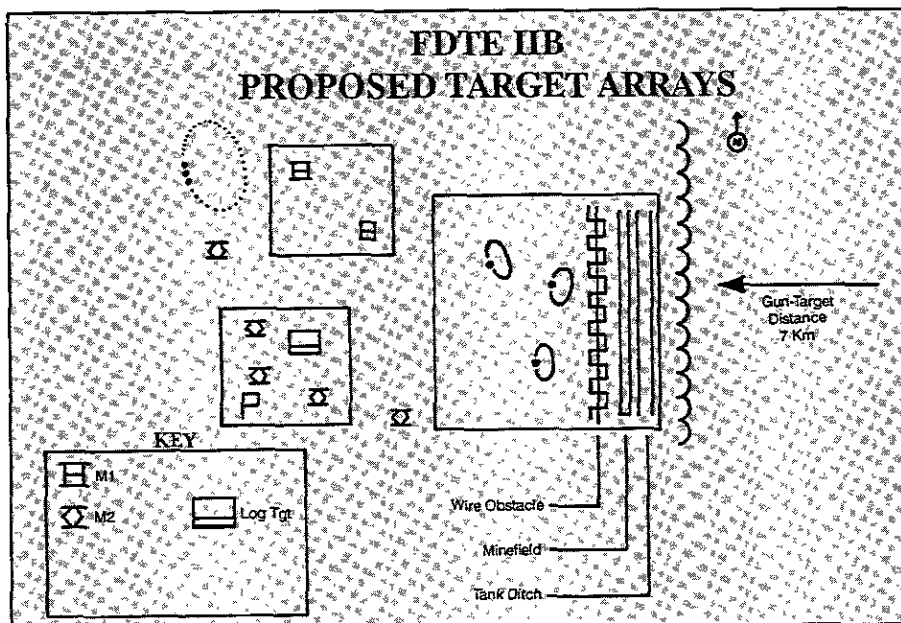
Once the defense plan was outlined, combat engineers constructed the fighting positions and obstacles. Representatives from the U.S. Army Engineer School supervised the construction to ensure that it proceeded in accordance with Field Manual (FM) 5-103, Survivability. The positions were manned with wooden mannequins clothed in U.S. uniforms and using U.S. equipment.

The TRADOC Research Analysis Command developed the fire plan for the Soviet artillery effects test, applying Soviet techniques to U.S. delivery systems. We fired only the preparation for the attack portion of the fire plan. The "threat artillery" was given a series of intelligence summaries that provided the targeting data; these summaries were designed to give the "enemy" only the information he could expect to receive from his own collection agencies. The "threat commander's" criterion for the preparation was 30 percent destruction, and the targets were engaged in accordance with Soviet doctrine.

A 24-gun 155mm battalion fired the test, representing a 152mm Soviet artillery battalion. The target array was attacked with 1,152 rounds of high explosive (HE) ammunition armed with both point-detonating (PD) and variable time (VT) fuzes.

We measured results on the target array incrementally (after volleys) and again after the entire preparation was fired. The following are our observations:

- A fighting position built to the specifications of FM 5-103 will withstand artillery rounds that hit 15 feet or more from the position. Although this observation is valid for all 155mm or smaller weapons, rounds that hit within 15 feet can destroy even good positions.
- Personnel in properly constructed fighting positions are protected from much fragmentation and blast. This does not take into account the physiological and psychological effects on personnel caused by artillery fire, because there was no way to measure



this during the test. History has shown, however, that unmotivated or poorly trained soldiers do not stand up well to large concentrations of artillery.

- Artillery rounds will collapse overhead protection if it is not properly constructed.

• Kevlar helmets and the personnel armor system for ground troops (PASGT) improve personnel protection against fragmentation. There were many incidents in which fragmentation was stopped by a helmet or PASGT.

- Positions built on rear slopes offer increased survivability.

• Fighting positions should not be built any larger than necessary. Larger positions require additional construction material as well as reinforcement material for the added overhead weight. Additional space and a larger opening also make it easier for fragments to enter the fighting position.

• Quick, accurate counterbattery fires are the best defense against artillery attack. Counterbattery fire was not included in the test, and the threat was allowed to fire the entire fire plan. Enemy fire must be countered immediately.

- If a unit is targeted while in a relatively static defensive posture, it is extremely vulnerable to incoming artillery fire.

This force development test demonstrated that properly constructed fight-

ing positions can protect dismounted infantrymen from artillery fires. Additional work needs to be done, however, in redesigning the contents of a push package for survivability materials. In the current configuration, these materials are bulky and heavy. Too, the current designs for overhead cover do not allow for difficult or degraded building conditions.

The Army needs to develop a simple "how to" manual for constructing field fortifications. No such simple guidance manual now exists.

To survive, a unit must train its soldiers in the proper construction of fighting positions, making the best possible use of natural terrain and any available materials. In short, units must prepare their defensive positions before the enemy opens fire, and must kill his artillery before he can kill them.

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